

# **Government Support for Nuclear Power: Nuclear Power 2010 and EPAAct 2005 Incentives**

Rebecca Smith-Kevern  
Director for Light Water Reactor Technologies  
Office of Nuclear Energy

August 30, 2010



# Nuclear Energy – A Matter of Public Policy

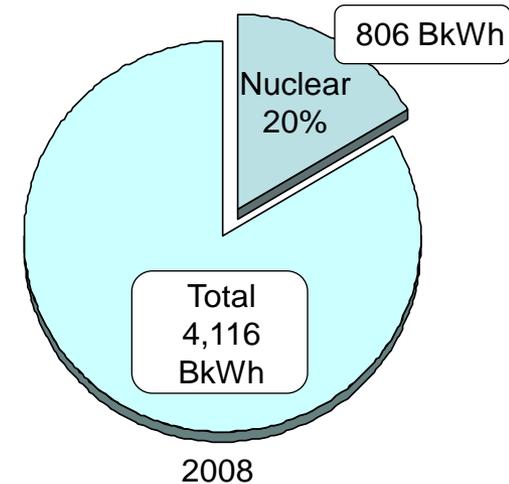
## Nuclear Energy

### TM Nuclear power is clean, reliable base load energy source

- Provides about 20% of U.S. electricity generation mix
- Provides over 70% of U.S. emission-free electricity
- Avoids about 700 MMTCO<sub>2</sub> each year
- Helps reduce overall NO<sub>x</sub> and SO<sub>x</sub> levels

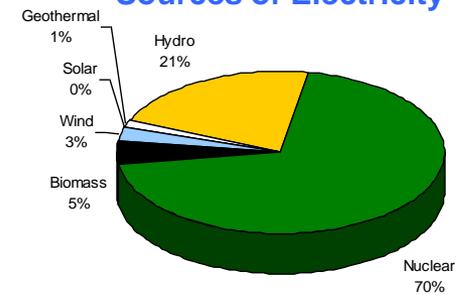


### U.S. Electricity Net Generation



Source: Energy Information Administration

### Net Non-emitting Sources of Electricity



Source: Energy Information Administration

# The National Interest – *Additional clean energy is needed*

**TM U.S. electricity demand projected to increase ~28% by 2035**

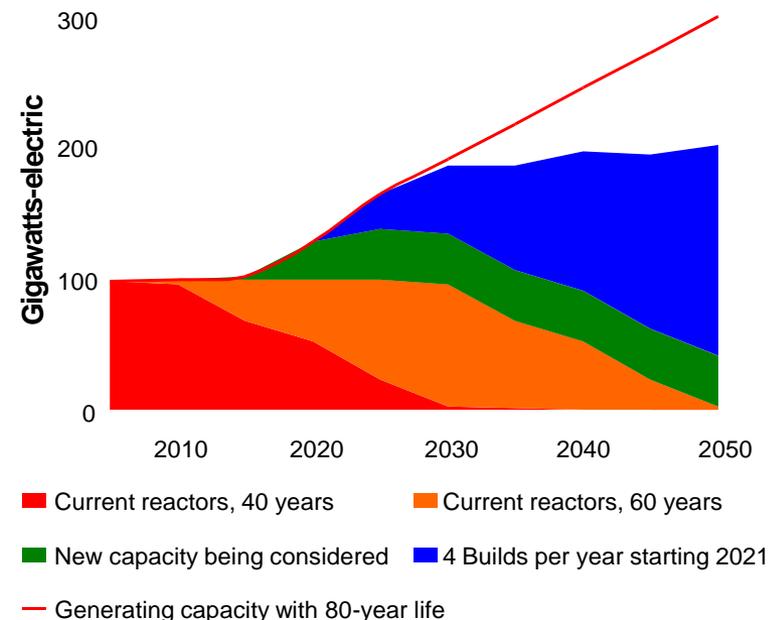
- Annual CO2 emissions projected to increase by 275 million metric tons to a total of 2,634

**TM Nuclear generation is critical to:**

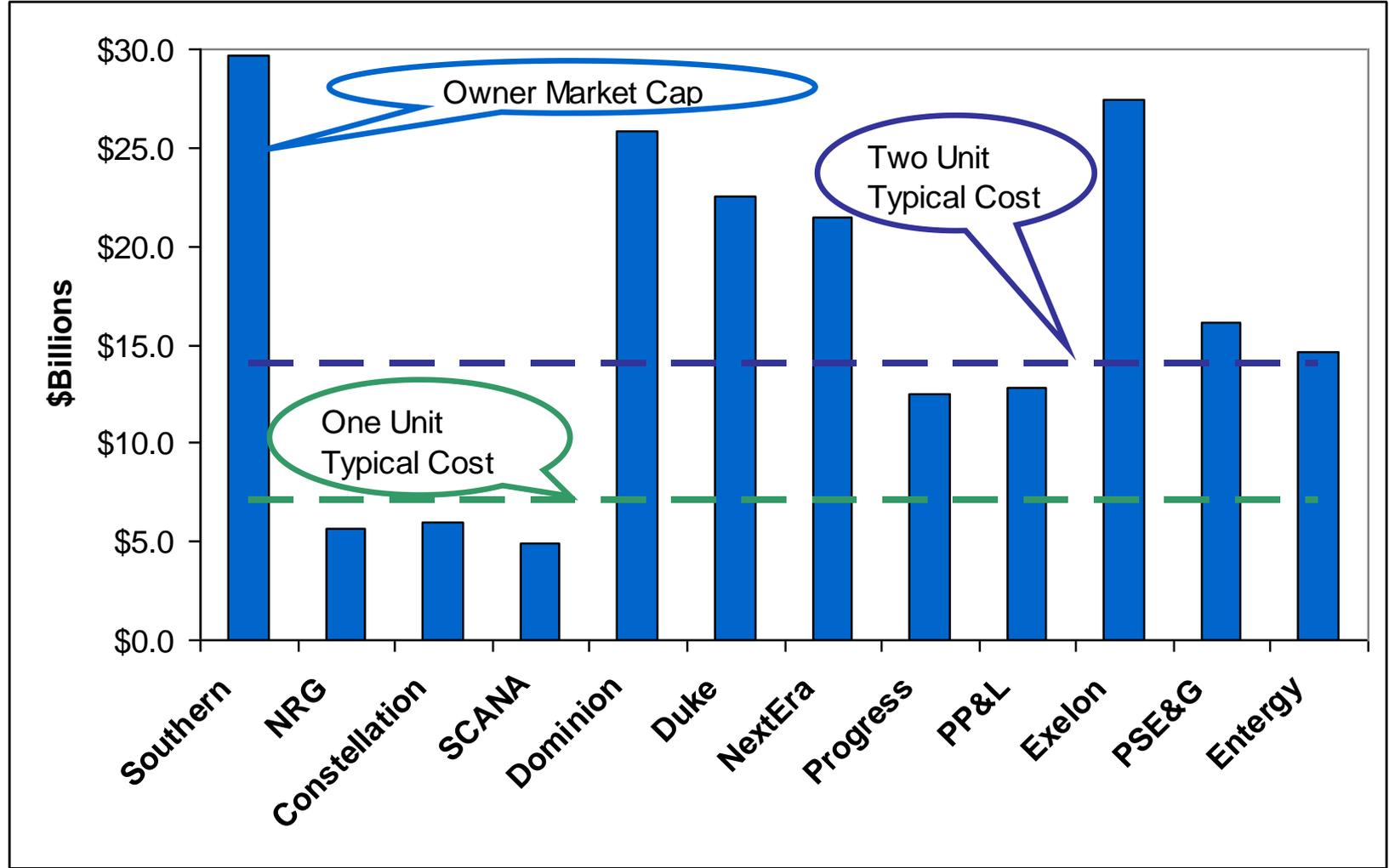
- Reducing greenhouse gases
- Meeting electricity demand
- Ensuring energy supply security and grid reliability

**TM New plants needed to meet demand but also need to keep existing plants operating as long as safely possible**

*Projected Nuclear Power Generation*



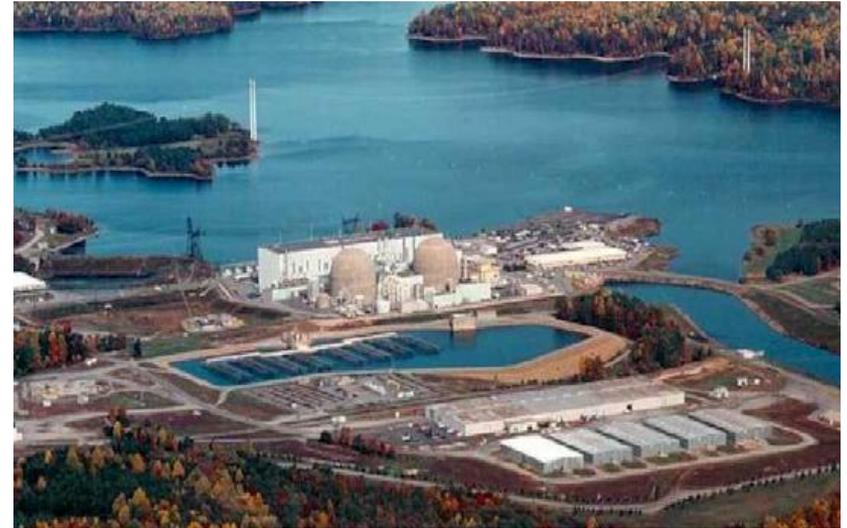
# Why is the Industry hesitating?



# Uncertainties

## Nuclear Energy

- TM Regulatory Uncertainty -- power companies lacked confidence that the untested “one-step” licensing process would not lead to excessive delays**
- TM Technical Uncertainty – cost of first-of-a-kind engineering to develop and bring to market advanced nuclear plant technologies is substantial**
- TM Financial Uncertainty -- financial community and power companies lack confidence in how much new plants will cost and how long they will take to reach operation**



## 10 CFR Part 52

- TM Alternative licensing process originally issued by NRC in 1989**
- TM Established Combined Construction and Operating License (COL) as single, “one-step” licensing process intended to complete licensing requirements prior to construction.**
- TM Modular process allows for a certified reactor design to be referenced by COL applicant.**
  - Allows use of pre-approved, standardized, “off-the-shelf” designs
  - Independent of site or utility that wants to build it
- TM Also established Early Site Permit that may also be referenced**
  - Addresses site safety, environmental impacts, emergency planning
  - Allows for site preparation and limited construction activity
  - Uses a Plant Parameter Envelope method to bound plant characteristics
  - Once granted, an ESP is valid for 10 to 20 years and may be renewed
- TM Issues resolved in design certification and ESP processes not reconsidered in COL**

# Support for Nuclear Power Expansion

## TM Nuclear Power 2010 Program

- Early Site Permit Project
- New Plant Licensing Demonstration Project

## TM Energy Policy Act of 2005

- Title XVII, “Loan Guarantees”
- Section 638, “Standby Support”
- Section 1306, “Production Credit”



# Nuclear Power 2010 ... Began as a Demonstration

## TM Program initiated in February 2002

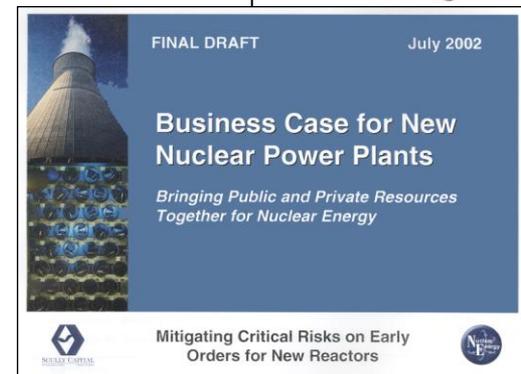
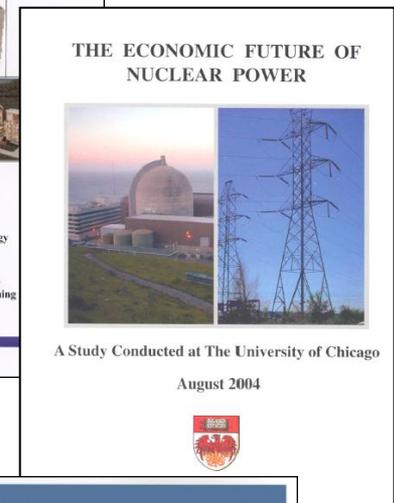
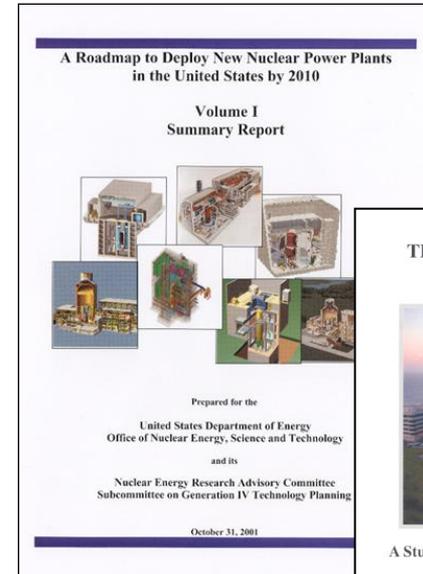
- No deployment then contemplated

## TM Based on *Near-term Deployment Roadmap* and other studies

## TM Government/industry cooperative effort

- 50-50 cost-shared industry projects
- Competitively awarded cooperative agreements

## TM Reducing cost of *first* plants to get to *next* plants



# Nuclear Power 2010 ... Program Scope and Goal

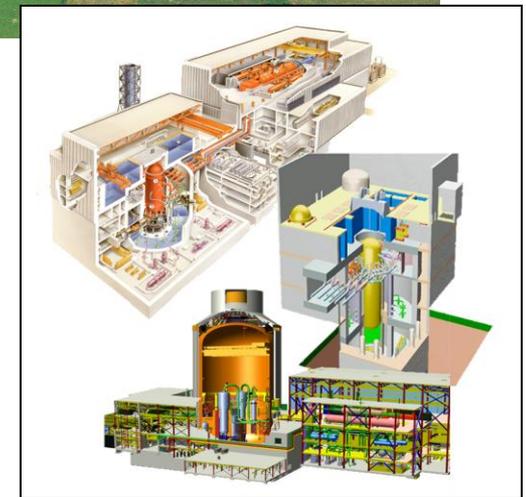
**TM Explore sites for new nuclear plants**

**TM Demonstrate key untested regulatory processes**

- Three Early Site Permit (ESP)
- Two Combined Construction and Operating License Applications (COLAs)

**TM Develop new light water reactor designs**

- Design certification for new reactors (DCDs)
- Final design/first-of-a-kind engineering (FOAKE) for new, standardized nuclear plant designs



**Program  
Goal**

*Paving the way for industry decisions to build new, advanced light water reactor nuclear plants in the United States.*

# Nuclear Power 2010 ... Measuring Progress toward Deployment

## TM **Early Site Permits (~3.5 years):**

- 4 issued by NRC (Clinton, Grand Gulf, North Anna, Vogtle)
- 2 currently under NRC review (Hope Creek; Victoria County)
- 2 additional permits expected

## TM **Construction and Operating License Applications (COLAs) (~4 years):**

- 17 companies have submitted applications for 26 new reactors for NRC review
- Of these, 10 power companies have participated in NP 2010
- 13 applications remain under review; 4 have been suspended
- 7 additional applications for 10 new reactors expected by 2012

## TM **Reactor Design Certifications (~5 years):**

- Two designs certified being considered for deployment in the US: GE ABWR, Westinghouse AP 1000
- Four designs under NRC certification review: GE ESBWR, AP 1000 Amendment, Areva US-EPR, and Mitsubishi US-APWR

# Energy Policy Act of 2005:

## *Financial Incentives for First Movers*

### **TM Loan Guarantees**

- Covers up to 80% of total project cost for up to 30 years
- Available for new nuclear reactors (up to \$18.5 billion) and front-end fuel cycle facilities (up to \$2 billion); \$36B in new authority requested for FY2011
- Conditional commitments have been made for 2 loan guarantees.

### **TM Standby Support Delay Risk Insurance**

- Covers cost of certain regulatory and litigation delays, up to \$2 billion
- Available for first 6 new nuclear reactors

### **TM Production Tax Credits**

- Allows tax credits for electricity production from advanced nuclear power facilities for an 8-year period
- Allocates 1.8¢/kWh with a maximum of \$125 million per each 1,000 megawatts allocated per year
- National megawatt capacity limitation of 6,000 megawatts

# Moving toward construction

## TM Long-Lead Equipment Orders:

- Nine utilities have ordered large forgings (reactor vessels and turbine generators)

## TM Engineering, Procurement, and Construction Contracts:

- Four contracts signed (Vogtle, V.C. Summer, South Texas, and Shearon Harris)
- Others being negotiated

## TM Plant Construction:

- Limited site preparatory work has been initiated for Vogtle, V.C. Summer, Calvert Cliffs, and South Texas nuclear projects; construction resumed at Watts Bar 2 with an estimated completion date of 2013



# Summary

- TM Nuclear power remains a key element of U.S. energy strategy**
- TM NP2010 and other incentives have been successful in jumpstarting the U.S. Nuclear Renaissance**
- TM However, substantial barriers remain to the large scale construction of new nuclear power plants**

